

DOCKET NO: 296975US0XPCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
TETSUZO MIKI, ET AL. : EXAMINER: CROUSE, B.A.
SERIAL NO: 10/594,273 :
FILED: JULY 24, 2007 : ART UNIT: 1786
FOR: CARBAZOLE DERIVATIVE :
CONTAINING FLUORENE GROUP
AND ORGANIC
ELECTROLUMINESCENCE
DEVICE

REPLY BRIEF

COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

SIR:

The following is a reply to the Examiner's Answer mailed August 18, 2011 to Appellants' appeal of the final rejection of Claims 1-27 as being obvious over Lee et al (US 2005/0074632), Qiu et al (US 7,227,027), or Sato et al (JP 2002-008860) mailed November 29, 2010. The Appeal was filed May 25, 2011, with a substitute Appeal filed July 11, 2011.

I. Related Appeals and Interferences

Appellants, Appellants' legal representative and their assignee are not aware of any appeals or interferences which will directly affect or be directly affected by or having a bearing on the Board's decision in this appeal.

II. Status of Claims

Claims 1-27 are the only claims pending in the above-identified application.

No claims that have been presented for examination have been allowed.

No claims that have been presented for examination have been denied entry.

No claims have been withdrawn from examination.

No claims stand objected to.

No claims that have been presented for examination were canceled during prosecution.

Claims 1-27 are elected claims in this application.

Claims 1-27 stand rejected.

Claims 1-27 are appealed herein.

Claims 1-27 appear in the attached Claims Appendix.

Claims 1 and 2 are the only independent claim subject to examination in this application.

III. Grounds of Rejection to be Reviewed on Appeal

1. Claims 1-8, 10, 12, 17-19, 21, and 23 stand rejected under 35 U.S.C. §103(a) over Lee et al (US 2005/0074632).
2. Claims 1-9, 11, 13-20, 22, and 24-27 stand rejected under 35 U.S.C. §103(a) over Qiu et al (US 7,227,027).
3. Claims 1-9, 13, 16-20, 24, and 27 stand rejected under 35 U.S.C. §103(a) over Sato et al (JP 2002-008860).

IV. Arguments

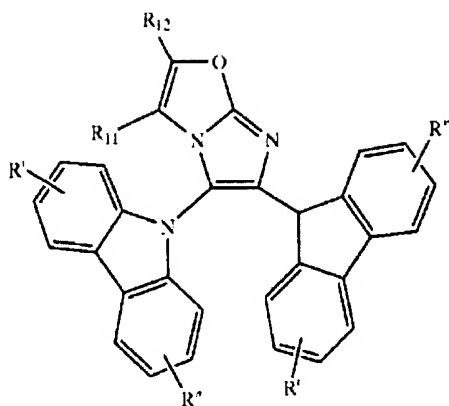
A. Claims 1-8, 10, 12, 17-19, 21, and 23 stand rejected under 35 U.S.C. §103(a) over Lee et al (US 2005/0074632). This rejection is untenable and should not be sustained.

The Examiner continues to commit reversible error in maintaining that the claimed invention is obvious over Lee et al.

The Examiner acknowledges that Lee differ from the claimed invention because this reference fails to specifically exemplify a compound with in the scope of the claimed invention. Indeed, Lee does not exemplify a compound where Ar is a substituted group containing the specific substituents as in the claimed invention. That is Lee does not exemplify a compound where Ar is “a substituted aromatic hydrocarbon group, a substituted aromatic heterocyclic group, or a substituted condensation polycyclic aromatic group, wherein the substituent is selected from the group consisting of a fluorine atom, a chlorine atom, a cyano group, a nitro group, an alkyl group, an alkoxy group, a trifluoromethyl group, a phenyl group, a tolyl group, a naphthyl group, and an aralkyl group”. Despite this acknowledgement, the Examiner alleges that the skilled artisan would have found it obvious to arrive at this distinction because the generic disclosure of the compounds within Lee to embrace the compounds as claimed including the substituents.

Appellants disagree with this position by the Examiner. Specifically, Lee explicitly distinguishes from the alleged substitution the Examiner alleges would be obvious based on the generic description of permissible groups for R1-R12. The Examiner points to the compound of generic formula 7 as providing the basis for this rejection. Formula 7 appears on page 3 of Lee as:

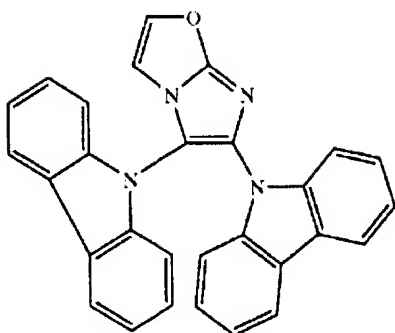
Formula 7



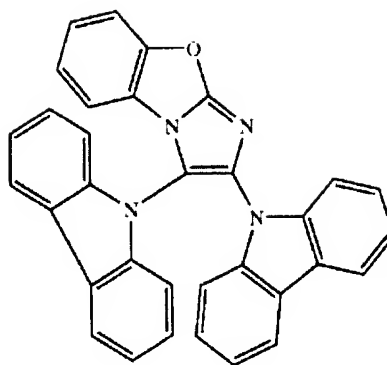
In the Office Action and again in the Advisory Action and the Examiner's Answer, the improperly Examiner contends that, based on paragraph [0011] the artisan would have made the substitutions to the imidazole group at R11 and R12 to arrive at the claimed invention. However, this is not correct. The Examiner makes the same mistake when referencing paragraph [0026] in the Examiner's Answer.

The description in paragraph [0011] is related to the overly generic disclosure of the millions of possible compounds of formula 1. However, Formula 7 cited by the Examiner as the starting point for the alleged obviousness of the claimed invention specifically defines the universe of permissible substituents at R11 and R12 for the compound of Formula 7. In no way does paragraph [0033] define the permissible substituents at R11 and R12 as "preferred embodiments" as the Examiner alleges. Indeed, paragraph [0033] is quite clear and specifically limits the scope of R11 and R12 for Formula 7 as being "hydrogen or may combine together to form a substituted or unsubstituted C2-C30 saturated or unsaturated ring".

Consistent with this restriction, in paragraph [0045] on page 31, Lee provide the following two specific compounds:



VII-118



In view of the foregoing, Lee actually teaches away from the substitution the Examiner alleges would be obvious. The Examiner is reminded that “a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention.” *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984) (see MPEP §2141.02).

In the Examiner’s Answer, the Examiner alleges that this meritless rejection is somehow strengthened by alleging that “appellant relies on the same level of generic disclosure having closely matching scope to that of the prior art.” This allegation misses the fundamental point. The question is not whether the application in question provides support for the claimed invention (which it does) or whether the scope offered in the present application for the claimed invention is generic, the question is whether the artisan possessing Lee would have envisioned the claimed invention. Clearly, for the reasons given above, this would not be the case.

Thus, the reasons given above, it is respectfully requested that this rejection be REVERSED.

B. Claims 1-9, 11, 13-20, 22, and 24-27 stand rejected under 35 U.S.C. §103(a) over Qiu et al (US 7,227,027). This rejection is untenable and should not be sustained.

The Examiner continues to commit reversible error in maintaining that the claimed invention is obvious over Qiu et al.

As was the case with Lee, the Examiner acknowledges that Qiu differs from the claimed invention because these references fail to specifically exemplify a compound within the scope of the claimed invention. Neither of these references exemplify a compound where Ar is a substituted group containing the specific substituents as in the claimed invention. Specifically, Qiu does not exemplify a compound where Ar is “a substituted aromatic hydrocarbon group, a substituted aromatic heterocyclic group, or a substituted condensation polycyclic aromatic group, wherein the substituent is selected from the group consisting of a fluorine atom, a chlorine atom, a cyano group, a nitro group, an alkyl group, an alkoxy group, a trifluoromethyl group, a phenyl group, a tolyl group, a naphthyl group, and an aralkyl group”. Despite this acknowledgement, the Examiner alleges that the skilled artisan would have found it obvious to arrive at this distinction because the generic disclosure of the compounds within these references embrace the compounds as claimed including the substituents. Again, Appellants disagree.

Specifically, the Examiner is reminded that when a single prior art reference which discloses a genus encompassing the claimed species or subgenus but does not expressly disclose the particular claimed species or subgenus, Office personnel should attempt to find additional prior art to show that the differences between the prior art primary reference and the claimed invention as a whole would have been obvious. MPEP §2144.08 In the case at hand, the Examiner's sole position remains that the generic disclosure of Qiu embraces the claimed sub-genus of compounds and, therefore, the claimed invention is obvious. The

courts have already confronted this type of rejection and rejected the same. The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994) ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious."); *In re Jones*, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed. Cir. 1992) (Federal Circuit has "decline[d] to extract from *Merck [& Co. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989)] the rule that... regardless of how broad, a disclosure of a chemical genus renders obvious any species that happens to fall within it."). See also *In re Deuel*, 51 F.3d 1552, 1559, 34 USPQ2d 1210, 1215 (Fed. Cir. 1995). Thus, Appellants submit that the Examiner has not met the burden necessary to support a *prima facie* case of obviousness.

In addition to the foregoing, Appellants note that in the second paragraph of the Advisory Action, the Examiner appears to assert that Qiu discloses examples of the substituents that are mostly overlapping with the presently claimed species as the substituent to Ar. In this regard, the Examiner refers to column 6, lines 3-5 of Qiu. However, this disclosure by Qiu is not about substituents to linking groups, but about R1 to R16 (i.e., substituents to the carbazole groups). See formula III. Therefore, the Examiner's assertion is misplaced.

In lines 3-4 the last paragraph of the Advisory Action, the Examiner asserts that Sato in paragraph [0048] and Qiu in the exemplified compounds beginning in column 6 provide methyl substituents to the phenyl linking groups of the carbazole derivatives. However, Qiu discloses examples of preferred structures, which include those having substituents on rings (e.g., compounds (3)-(6) and (12)). However, none of these compounds has a skeleton that corresponds to the presently claimed compound (in other words, these compounds do not

have a fluorene group as required in the present invention). Thus, for several specific skeleton structures, Qiu discloses structures having substituents on rings as preferred examples. Taking this into account, the skilled artisan reading the disclosure of Qiu would have been taught that the substituted structures disclosed therein are preferred. However, with regard to the skeletons for which substituted structures are not disclosed the skilled artisan would not have been taught that certain substituted embodiments of those skeletons are preferred as well. Rather, the skilled artisan would be lead to embodiments other than substituted embodiments in view of the absence of disclosed examples of substituted embodiments.

Now, the Examiner cites column 6, lines 22-23 of Qiu as a support for his contention that the central group of formula (III) can be further substituted with similar substituent(s) as those presently claimed. See page 9 of the Examiner's Answer. In this regard, Appellants note that the the definition of formula (III), particularly the definition of its central part "A" (or "Y") appears to be inaccurate. For example, looking to the structure of compound (28) which is referred to by the Examiner, the central part (i.e., the part other than the two carbazole groups) does not appear to fit with any alternative listed as "Y". Although one might consider this central part corresponds to "aromatic group linked to spiro group", it should be noted that the fluorene group in this compound does not form a spiro structure. As well-known in the art and evidenced by the Extension and Revision of the Nomenclature for Spiro Compounds (IUPAC Recommendations 1999), Synopsis, Preamble, SP-0 and SP-1, a spiro compound has two (or three) rings which have only one atom in common and the two (or three) rings are not linked by a bridge.

Even if the central part could be considered as "aromatic group linked to spiro group", the disclosure of possible substituents at col. 6, lines 22-23 is not for the aromatic group, but

for the possible substituents on the fluorene group in compound (28), such suggestion has nothing to do with substituents on the two benzene rings in compound (28).

In other words, the teaching of column 6, lines 22-23 is irrelevant to the presently claimed substituent to "Ar" group of formula (1).

Moreover, for a claimed invention to be obvious, the possible modifications of the prior art must be finite. See, *Rolls-Royce PLC v. United Technologies Corp.*, 95 USPQ2d 1097 (Fed. Cir. 2010). As stated by the Federal Circuit:

To determine that an invention would have been obvious to try on the basis of the record before the time of invention, ***this court has clarified***, with respect to inventions requiring selection of a species from a disclosed genus, ***that the possible approaches and selection to solve the problem must be*** “known and ***finite***.” See *Abbott*, 544 F.3d at 1351 (holding as conditions in which “obvious to try” may negate patentability, “the problem is known, the possible approaches to solving the problem are known and finite, and the solution is predictable through use of a known option”). . . . In this case, the broad selection of choices for further investigation available to a person of ordinary skill included any degree of sweep. See *Takeda*, 492 F.3d at 1359 (holding the invention not obvious to try because the prior art disclosed a broad selection of compounds that an ordinarily skilled artisan could have selected for further investigation).

Rolls-Royce, at 1107, emphasis added.

This case is like that in *Rolls-Royce* in that there are countless possible theoretical modifications of the prior art with no teaching that any one modification should be selected.

Moreover, in *Procter & Gamble Co. v. Teva Pharmaceuticals USA, Inc.* (Fed. Cir. 2009), the Federal Circuit articulated a 3 element test for a *prima facie* case of obviousness based on structural similarity of a lead compound to a claimed compound as requiring: (1) a preliminary finding that one of ordinary skill...would have selected [the prior art compound] as a lead compound; (2) a person of ordinary skill must have reason to attempt to make the claimed compound by modifying the lead compound; and (3) a reasonable expectation of success in making the claimed compound by modifying the lead compound.

Qiu fails to meet this standard and the Examiner fails to provide a reasonable basis to support a conclusion otherwise.

Appellants submit that even if, *arguendo*, the Examiner has sufficiently provided that a *prima facie* case of obviousness exists (a point that Appellants disagree with for the reasons above), the Examiner is reminded that "[a] *prima facie* case of obviousness ... is rebuttable by proof that the claimed compounds possess unexpectedly advantageous or superior properties." See MPEP §2144.09 (citing *In re Paesch*, 315 F.2d 381 (C.C.P.A. 1963)). "Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness." No set number of examples of superiority is required. *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987)" Appellants submit that the experimental data presented in the specification clearly illustrates that substantial benefits flowing from the claimed method, which are enough to rebut even a *prima facie* case of obviousness.

In the Examiner's Answer, the Examiner alleges that the foregoing comparison is insufficient. It is well-established that it is necessary to compare the claimed subject matter with the closest prior art to be effective to rebut a *prima facie* case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979). Further, Applicants may compare the claimed invention with prior art that is more closely related to the invention than the prior art relied upon by the examiner. *In re Holladay*, 584 F.2d 384, 199 USPQ 516 (CCPA 1978); *Ex parte Humber*, 217 USPQ 265 (Bd. App. 1961). Appellants submit that they have met this burden and the comparison provided is relevant.

Specifically, the closest compound in the cited art is 9,9-bis(4-carbazolylphenyl)fluorene (CDPF) appearing as formula (28) in Qiu. CDPF is identical to compound (2) (see Example 1) of the present application. In Example 4 of the present

application, Appellants show that the work function of compound (3) (i.e., 9,9-bis(4-carbazolyl-3-methylphenyl)fluorene (CDMPF)) is higher than that of CDPF. Specifically, Example 4 shows the following work function for CDPF and CDMPF:

CDPF	Work function: 5.99 eV
CDMPF	Work function: 6.03 eV

In addition, Example 5 shows that the band gap value of CDMPF is greater than that of CDPF. Specifically, the band gap in Example 5 for CDPF and CDMPF were as follows.

CDPF	Gap value: 3.50 eV
CDMPF	Gap value: 3.55 eV

With respect to the foregoing data, the work function and band gap value of a host material should be greater than those of a dopant material in order for efficient energy transfer therebetween. Dopants used for fluorescence-emitting devices have high work function and band gap value. Accordingly, the compound having higher work function and band gap value than those of CDPF or CBP is highly valuable as a host material for an emitting layer of a fluorescence-emitting device since it has enhanced capability of dealing with a wider variety of dopant materials that are suitable for a fluorescence-emitting device.

Thus, to summarize the data from the examples in the present specification:

Work Function:

$$\text{CDMPF}(6.03) > \text{CBP}(6.00) > \text{CDPF}(5.99)$$

Band Gap Value:

$$\text{CDMPF}(3.55) > \text{CDPF}(3.50) > \text{CBP}(3.44)$$

In view of the foregoing, Appellants submit that CDMPF (representative of the presently claimed invention) is unexpectedly more suitable as a host compound for a dopant than CDPF disclosed by Qiu. Accordingly, Appellants submit that even a *prima facie* case of obviousness is rebutted and should be withdrawn.

The Examiner also maintains that the evidence to date is not commensurate in scope with the claimed invention (see, for example, pages 11, 13-14, and 16-17 of the Examiner's Answer). However, for the reasons above, the comparison shown is sufficiently commensurate in scope as it directly compares the closest compound in the cited art is 9,9-bis(4-carbazolylphenyl)fluorene (CDPF) appearing as formula (28) in Qiu to a representative example of the claimed invention. It should not be necessary to provide any comparison other than to the closest compound in the cited art to establish the unexpected benefits of the claimed invention as it compares to the cited art.

Thus, the reasons given above, it is respectfully requested that this rejection be REVERSED.

C. Claims 1-9, 13, 16-20, 24, and 27 stand rejected under 35 U.S.C. §103(a) over Sato et al (JP 2002-008860). This rejection is untenable and should not be sustained.

The Examiner continues to commit reversible error in maintaining that the claimed invention is obvious over Sato et al.

As was the case with Lee, the Examiner acknowledges Sato differs from the claimed invention because these references fail to specifically exemplify a compound within the scope of the claimed invention. Neither of these references exemplify a compound where Ar is a substituted group containing the specific substituents as in the claimed invention. Specifically, Sato does not exemplify a compound where Ar is "a substituted aromatic hydrocarbon group, a substituted aromatic heterocyclic group, or a substituted condensation polycyclic aromatic group, wherein the substituent is selected from the group consisting of a fluorine atom, a chlorine atom, a cyano group, a nitro group, an alkyl group, an alkoxy group, a trifluoromethyl group, a phenyl group, a tolyl group, a naphthyl group, and an aralkyl

group”. Despite this acknowledgement, the Examiner alleges that the skilled artisan would have found it obvious to arrive at this distinction because the generic disclosure of the compounds within these references embrace the compounds as claimed including the substituents. Again, Applicants disagree.

Specifically, the Examiner is reminded that when a single prior art reference which discloses a genus encompassing the claimed species or subgenus but does not expressly disclose the particular claimed species or subgenus, Office personnel should attempt to find additional prior art to show that the differences between the prior art primary reference and the claimed invention as a whole would have been obvious. MPEP §2144.08 In the case at hand, the Examiner sole position is that the generic disclosure of Sato embrace the claimed sub-genus of compounds and, therefore, the claimed invention is obvious. The courts have already confronted this type of rejection and rejected the same. The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994) ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious."); *In re Jones*, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed. Cir. 1992) (Federal Circuit has "decline[d] to extract from *Merck [& Co. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989)] the rule that... regardless of how broad, a disclosure of a chemical genus renders obvious any species that happens to fall within it."). See also *In re Deuel*, 51 F.3d 1552, 1559, 34 USPQ2d 1210, 1215 (Fed. Cir. 1995). Thus, Applicants submit that the Examiner has not met the burden necessary to support a *prima facie* case of obviousness.

In lines 3-4 the last paragraph of the Advisory Action, the Examiner asserts that Sato in paragraph [0048] and Qiu in the exemplified compounds beginning in column 6 provide methyl substituents to the phenyl linking groups of the carbazole derivatives.

However, as was the case with Qiu above, Sato discloses examples of preferred structures, which include those having substituents on rings. However, none of these compounds has a skeleton that corresponds to the presently claimed compound (in other words, these compounds do not have a fluorene group as required in the present invention). Thus, the skilled artisan reading the disclosure of Sato would have been taught that the substituted structures disclosed therein are preferred. However, with regard to the skeletons for which substituted structures are not disclosed the skilled artisan would not have been taught that certain substituted embodiments of those skeletons are preferred as well. Rather, the skilled artisan would be lead to embodiments other than substituted embodiments in view of the absence of disclosed examples of substituted embodiments.

The Examiner appears to rely on the substituents R^7 to R^{18} of formula (H-11) taught in paragraph [0030], specific compound (H-11) that is similar to the presently claimed compound but has no substituent, and specific compound (H-3) having methyl substituents on benzene rings.

However, the definition of formula (II') disclosed in paragraph [0030] merely lists almost infinite possibilities concerning the position and kind of substituents. Further, there is provided completely no suggestion therein concerning the association with some particular group selected among the broadly defined Z group. Among the specific compounds disclosed in paragraph [0048], only compound (H-13) has "R" groups different from hydrogen atom. It is evident that this compound has no fluorene group and is structurally distinct from the presently claimed compound. The considerably broad and inclusive

disclosure of Sato would not have motivated the skilled artisan to selectively introduce specific substituents into specific positions of compound (H-11). Sato merely provides a disclosure of possibilities that can correspond to the presently claimed requirements, and fails to provide any teaching or suggestion to lead the skilled artisan to the present invention.

Furthermore, in the only one substituted example, compound (H-3), two methyl groups present on each benzene ring. This is different from the substitution mode of the compound of formula (3) in claims 16 and 27.

Moreover, for a claimed invention to be obvious, the possible modifications of the prior art must be *finite*. See, *Rolls-Royce PLC v. United Technologies Corp.*, 95 USPQ2d 1097 (Fed. Cir. 2010). As stated by the Federal Circuit:

To determine that an invention would have been obvious to try on the basis of the record before the time of invention, ***this court has clarified***, with respect to inventions requiring selection of a species from a disclosed genus, ***that the possible approaches and selection to solve the problem must be*** “known and *finite*.” See *Abbott*, 544 F.3d at 1351 (holding as conditions in which “obvious to try” may negate patentability, “the problem is known, the possible approaches to solving the problem are known and finite, and the solution is predictable through use of a known option”). . . . In this case, the broad selection of choices for further investigation available to a person of ordinary skill included any degree of sweep. See *Takeda*, 492 F.3d at 1359 (holding the invention not obvious to try because the prior art disclosed a broad selection of compounds that an ordinarily skilled artisan could have selected for further investigation).

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Moreover, in *Procter & Gamble Co. v. Teva Pharmaceuticals USA, Inc.* (Fed. Cir. 2009), the Federal Circuit articulated a 3 element test for a *prima facie* case of obviousness based on structural similarity of a lead compound to a claimed compound as requiring: (1) a preliminary finding that one of ordinary skill...would have selected [the prior art compound] as a lead compound; (2) a person of ordinary skill must have reason to attempt to make the

claimed compound by modifying the lead compound; and (3) a reasonable expectation of success in making the claimed compound by modifying the lead compound.

Sato fails to meet this standard and the Examiner fails to provide a reasonable basis to support a conclusion otherwise.

Applicants submit that even if, *arguendo*, the Examiner has sufficiently provided that a *prima facie* case of obviousness exists (a point that Applicants disagree with for the reasons above), the Examiner is reminded that "[a] *prima facie* case of obviousness ... is rebuttable by proof that the claimed compounds possess unexpectedly advantageous or superior properties." See MPEP §2144.09 (citing *In re Paesch*, 315 F.2d 381 (C.C.P.A. 1963)). "Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness." No set number of examples of superiority is required. *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987)" Applicants submit that the experimental data presented in the specification clearly illustrates that substantial benefits flowing from the claimed method, which are enough to rebut even a *prima facie* case of obviousness.

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Specifically, the closest compound in the cited art is 9,9-bis(4-carbazolylphenyl)fluorene (CDPF) appearing as compound (H-11) of Sato. CDPF is identical to compound (2) (see Example 1) of the present application. In Example 4 of the present application, Applicants show that the work function of compound (3) (i.e., 9,9-bis(4-carbazolyl-3-methylphenyl)fluorene (CDMPF)) is higher than that of DCPF. Specifically, Example 4 shows the following work function for CDPF and CDMPF:

CDPF	Work function: 5.99 eV
CDMPF	Work function: 6.03 eV

In addition, Example 5 shows that the band gap value of CDMPF is greater than that of CDPF. Specifically, the band gap in Example 5 for CDPF and CDMPF were as follows.

CDPF	Gap value: 3.50 eV
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With respect to the foregoing data, the work function and band gap value of a host material should be greater than those of a dopant material in order for efficient energy transfer therebetween. Dopants used for fluorescence-emitting devices have high work function and band gap value. Accordingly, the compound having higher work function and band gap value than those of CDPF or CBP is highly valuable as a host material for an emitting layer of a fluorescence-emitting device since it has enhanced capability of dealing with a wider variety of dopant materials that are suitable for a fluorescence emitting device.

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Band Gap Value:

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In view of the foregoing, Applicants submit that CDMPF (representative of the presently claimed invention) is unexpectedly more suitable as a host compound for a dopant than CDPF disclosed by Sato. Accordingly, Applicants submit that even a *prima facie* case of obviousness is rebutted and should be withdrawn.

The Examiner also maintains that the evidence to date is not commensurate in scope with the claimed invention (see, for example, pages 11, 13-14, and 16-17 of the Examiner's Answer). However, for the reasons above, the comparison shown is sufficiently commensurate in scope as it directly compares the closest compound in the cited art is 9,9-bis(4-carbazolylphenyl)fluorene (CDPF) appearing as compound (H-11) of Sato to a representative example of the claimed invention. It should not be necessary to provide any comparison other than to the closest compound in the cited art to establish the unexpected benefits of the claimed invention as it compares to the cited art.

Thus, the reasons given above, it is respectfully requested that this rejection be REVERSED.

V. CONCLUSION

For the above reasons, Claims 1-27 are patentable over the art of record. Therefore, the Examiner's rejection should be REVERSED.

Respectfully submitted,

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